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U. S. DEPARTMENT OF AGRICULTURE  
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FOREST PEST LEAFLET 10

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## Red Pine Scale

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The red pine scale (*Matsucoccus resinosae* Bean and Godwin) was first discovered in 1946 near the Hemlock Reservoir at Easton, Conn., where it was seriously damaging 30-year-old red pine plantations. By 1950, the scale had spread from the area at Easton to red pine plantations approximately 4 miles to the northeast. In the same year, scale infestations were found on Long Island and southeastern Westchester County, N. Y. In 1953, infestations occurred in plantations scattered over an area of at least 60 square miles in Connecticut and 40 square miles on Long Island (fig. 1). The red pine scale also has been found in the vicinity of Yonkers in the western part of Westchester County.

The area of known infestation to date is south of the natural range of red pine, the insect being found mainly in plantations, in nurseries, or on ornamental trees. No evidence of the scale has been discovered in natural stands of red pine in northern New York and northern New England. Spread of this insect is apparently by the wind. Studies have shown that first-stage larvae are airborne for at least a quarter of a mile.

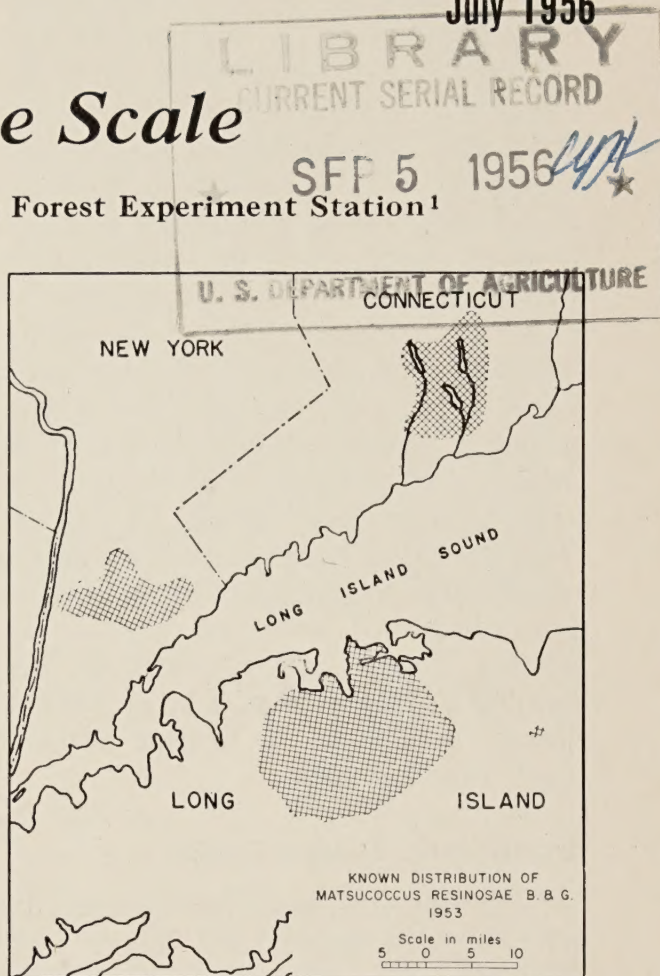


Figure 1.—The known distribution of red pine scale.

### Host Trees

The red pine scale apparently attacks one specific host, being found only on red pine (*Pinus resinosa* Ait.).<sup>2</sup> Attempts to establish the scale on other species of pines (jack, pitch, Scotch, white, Austrian, and mugho) have been unsuccessful. These species sometimes have red pine intermixed with them in the areas where the scale occurs. In

<sup>1</sup> Maintained by the Forest Service, U. S. Department of Agriculture, in cooperation with the University of Minnesota, St. Paul 1, Minn.

<sup>2</sup> Since preparation of the manuscript for this leaflet, two additional hosts have been reported by Dr. Hartzell: Japanese red pine (*Pinus densiflora* Sieb. & Zucc.) and Chinese pine (*P. tabulaeformis* Carr.).



nearly all cases the attacked red pines eventually die, but the other species of pines are not infested.

### Evidence of Infestation

The first visible indication of feeding by the scale insect is the light olive-green color of the current year's foliage on infested trees; the new growth is also shorter than normal. The foliage color changes slowly to a light yellow and finally to a brick red; the change appears first in individual branches, then gradually over the entire crown. A close examination of the underside of these branches, especially axils (the angle between a twig or leaf and the part from which it arises), will show masses of male cocoons resembling small fluffs of cotton. The tree dies soon after the foliage starts to change color. The bark on branches and boles of heavily infested trees has a swollen and cracked appearance, and an area of dead tissue can be found beneath each feeding scale.

### Economic Importance

The red pine scale has become one of the most important insect pests of red pine in the Northeast. Thousands of trees, ranging from nursery stock to mature trees, have already been killed. Many more are so severely injured that they will not survive attacks by secondary bark borers. Although restricted at present to several definite areas, the insect constitutes a serious threat to red pine plantations and natural stands throughout the entire range of the host.

### Description

The adult females are brownish red and wingless, ranging from  $\frac{1}{16}$  to  $\frac{3}{16}$  inch long. The body is roughly pear shaped and coarsely wrinkled (fig. 2, *A*). The preadult males resemble the females but are

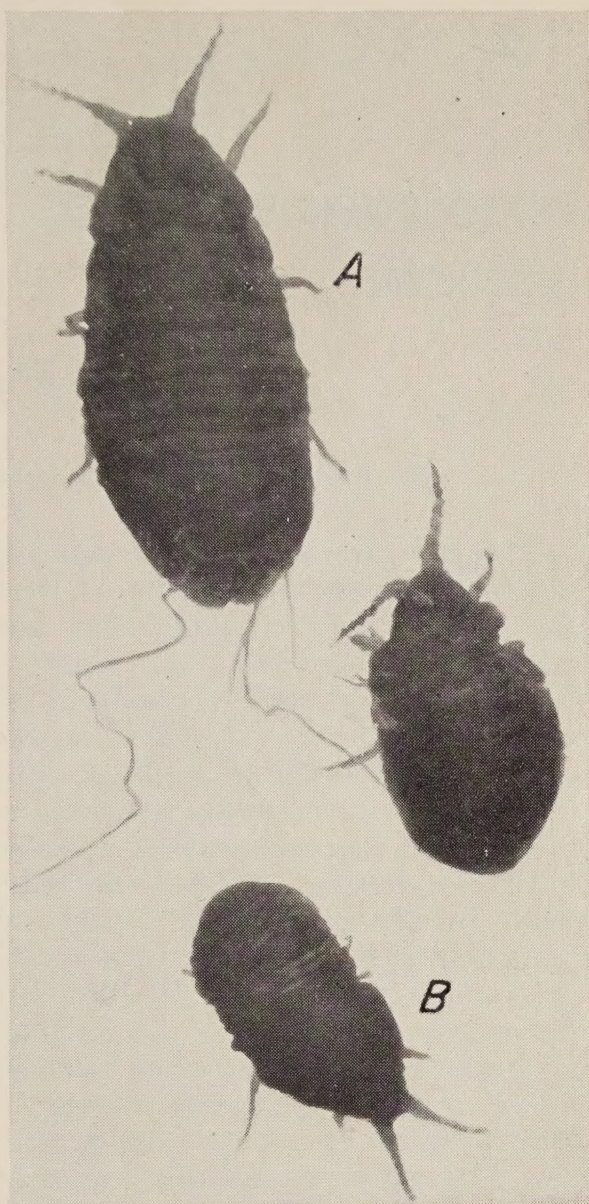


Figure 2.—Red pine scales: A, Adult female, dorsal view; B, preadult males, dorsal view.

smaller,  $\frac{1}{32}$  to  $\frac{1}{16}$  inch long (fig. 2, *B*). These preadult males, soon after emergence, transform into true adults inside a loosely woven, white spindle-shaped, waxy cocoon (fig. 3). The true adult males are two-winged, midgelike in appearance, and have a prominent brush of long white waxy filaments at the rear end of the abdomen. The minute, amber-yellow, oval-shaped eggs are laid in a white, loosely woven, waxy sac attached to the abdomen of the female. The first-stage larvae resemble the adult females but are much smaller—0.4 by 0.2 millimeter. Projecting from the rear end of each larvae are two long sen-





Figure 3.—Masses of male cocoons of red pine scale on lower side of branch axil.

sory hairs. The first-stage larvae transform into an intermediate legless stage, which is nearly elliptical in shape and without antennae (fig. 4). The skin of this stage is tough and leathery; originally amber-yellow, it later changes to a grayish-yellow with darker margins.

### Seasonal History

The red pine scale has two well-defined generations during the year. The summer generation has its first eggs laid in May and the adults emerge in early August. These lay the eggs for the fall generation in late August or early September and the adults emerge the following



Figure 4.—Intermediate stage larvae of red pine scale on twig of infested red pine. The bark scale has been removed to expose the insects.

spring (fig. 5). All evidence indicates that the fall generation overwinters as partly grown first-stage larvae. In the spring these larvae resume feeding, and by the first week in April the transformation into the intermediate stage begins. The intermediate stage develops rapidly, and the preadult males appear about the first of May. These males immediately enclose themselves in silken cocoons and transform into true adults. They emerge at approximately the same time as the adult females.

Within a day or two mating takes place and eggs are laid. By the first of June first-stage larvae appear. After a short period of moving around, these first-stage larvae settle down under a bark scale and start to feed. They will remain stationary at this position during the rest of their feeding period. These larvae develop into the intermediate



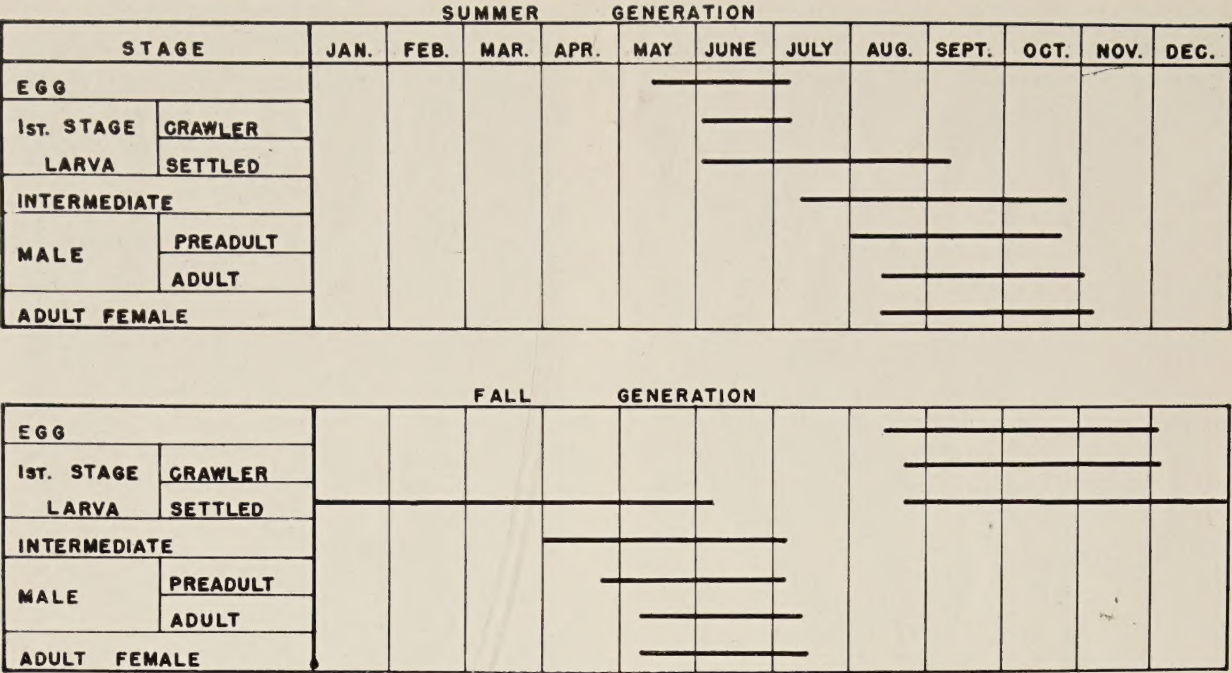


Figure 5.—The seasonal life cycle for summer and fall generations of red pine scale.

stage by the middle of July, and the adult males and females of the summer generation emerge around the middle of August. The eggs that produce the overwintering generation are laid at this time. Considerable overlapping of both generations causes some confusion in determining the duration of the various stages.

Control

Several species of native predators attack the red pine scale, but none has ever been recorded abundant enough to effect any appreciable control. A number of insecticides have been tested against the

scale in Connecticut and Long Island. Only three, Systox, ethylene dibromide, and a 2-percent oil emulsion, showed any promise. The amount of control effected by single applications of these insecticides was considered unsatisfactory. Further chemical control tests are needed.

References

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